

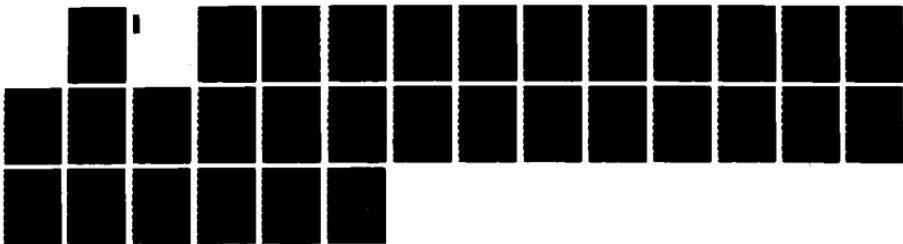
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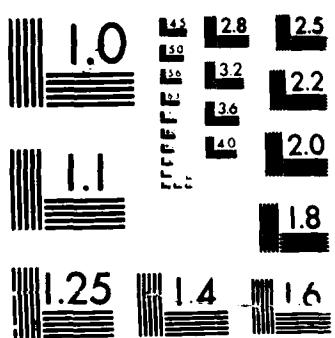
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USAWC MILITARY STUDIES PROGRAM

FIELD ARTILLERY IN THE DEEP BATTLE

An Individual Essay

by

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United States Army War College
Carlisle Barracks, Pennsylvania 17013
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ABSTRACT

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With the advent of the AirLand Battle Doctrine, the ability of the United States Field Artillery to adequately fulfill its required role has been called into question. This paper looks at the Threat opposing the U.S. Army in Europe, the U.S. Field Artillery's role in the Deep Attack scenario, some artillery procedures designed to cope with the Threat, and last but not least, an opinion as whether it can be done at the present time.

The Field Artillery in the Deep Battle

One of the greatest challenges of the 20th century is that of trying to understand the philosophy of the Soviet Union, in other words what makes "Ivan Tick". There are a great number of career diplomats, learned academia, and just plain Sovietologists who spend their life trying to puzzle out the interworkings of the Kremlin.

There are some who think that Soviet policy is one of opportunism. Some others believe that the Soviets are insistent upon recognition from the United States that the Soviets are coequal to the US. Another school of thought is that the Soviets require an external threat so that they can provide a strong authority foreign policy, in order focus the internal unrest outward, and thus justify the continued monopoly of power by the Communist party.

Winston Churchill said it best, in a broadcast on October 1, 1939, in regards to the Soviets collusion with Nazi Germany to dismember Poland: "I cannot forecast to you the action of Russia. It is a riddle wrapped in a mystery inside of an enigma; but perhaps there is a key. That key is Russian national interest."¹

The term national interest is difficult to define especially in the case of the Soviet Union. However, it is important I think to keep in mind that the Soviet's have never waivered from their avowed goal, that being world domination. While the ultimate goal of the Soviets hasn't changed the method by which they intend to get there has changed. During the 1950's the Soviet's said that

war with the capitalists nations was inevitable. During the 1980's, this is no longer true. The Soviet Union does not now consider that war is inevitable. Despite this change in tactics by the Soviet's, the modernization and build-up of their nuclear and conventional forces has not stopped.

The USSR continues to pursue an arms build-up that is unprecedented in the history of the world. Since the end of World War II the USSR has devoted very significant amounts of its Gross National Product to its military build-up. The USSR scaled back their ground forces during the Khruschev era, because of the increased emphasis on achieving nuclear parity with the United States.

The USSR achieved nuclear parity with the U.S. about 1970, and since that time it has been recognized as a legitimate world superpower. However it still does not possess a clear military superiority which would give it a high degree of confidence in the event of a strategic nuclear exchange with the U.S.. On the other hand the USSR does possess a tremendous conventional capability especially in Western Europe.

The Soviet goal is to win without fighting, this includes all goals, their long term goal is that everyone in the world will adopt their system of government. The Soviets want to be able to overwhelm their enemy before a shooting war would occur, by having an overwhelming superiority in weapons so that the enemy will be so intimidated that they will give in.

Accordingly the Soviets have continued their arms build-up, more than 30 new divisions have been added since 1967. Even though the Soviet economy is having difficulty at the present

time, and Gorbachev has promised to increase production of nonfood consumer goods, at best this will only delay the rate of build-up of the military.

Soviet military writings state that a future war would be a decisive clash on a global scale. The Soviets believe that an outcome favorable to their interests depends on complete unification of the political, economic, and military forces of all countries within the socialist coalition. To this end the Soviets have concentrated on developing and implementing a single strategic policy for the entire Warsaw Pact forces. The Soviets have devoted considerable energy toward building the Warsaw Pact into a strong military alliance.

In that regard, in the Western Teatr Voennyykh Deistvii (TVD), which includes the NATO Central Region, the Baltic approaches, East Germany, Poland, Czechoslovakia, and the western USSR, the Soviets have deployed the following forces:²

	Soviet	Warsaw Pact
Divisions	63	31
Tanks	19,460	9,800
APC/IFV	20,400	11,800
Artillery	15,000	5,800
Tactical SSM	580	230
Tac Airframes	2,320	1,600

The US Army envisions that a conflict with the Soviets in Western Europe would be of a high to mid-level intensity war. The war would be characterized by an absence of continuous fronts,

rapid and sharp changes in the strategic situation, and deep penetrations into rear areas of the forces involved. Forces would rely on mobility to maneuver and wage an intense struggle to seize and maintain the initiative.³

These battlefields are likely to be chaotic, intense, highly destructive, and rapid movement will be complimented by the use of advanced, highly lethal weapons throughout the battle area. Successful attack will require isolation of the battle area in great depth as well as the defeat of enemy forces in deeply echeloned defensive areas. Successful defense will require early detection of attacking forces, prompt massing of fires, interdiction of follow-on forces, and the containment and defeat of large formations by fire and maneuver. Throughout the battle area, attack and defense will often take place simultaneously as each combatant attempts to mass, economize locally, and maneuver against his opponent.

Taking into consideration all of the above information, a person might be justified in asking how the US Army will be able to conduct successful operations against an enemy that is so strong. The Army's answer is the AirLand Battle Doctrine. Doctrine being defined as a condensed expression of an approach to fighting campaigns, major operations, battles, and engagements. Tactics, techniques, procedures, organizations, support structure, equipment and training must all derive from it.

AirLand Battle Doctrine is a vast sweeping complex theory that is outside the scope of this paper, however, I would like to explore one facet of AirLand Battle Doctrine, that of Deep

Operations and the ability of the Field Artillery to contribute positively to the outcome of Deep Operations.

Since the Airland Battle concept was introduced, deep operations has been an area of high interest in the Army in general and the Field Artillery in particular. FM 100-5, Operations, defines deep operations as, "...operations at any echelon comprise activities directed against enemy forces not in contact designed to influence the conditions in which future close operations will be conducted. At the operational level, deep operations include efforts to isolate current battles and influence where, when and against whom future battles will be fought.

FM 100-5 goes on to say that such operations are not new to warfare in general or the American Army in particular, there were numerous instances during WW II, Korea and Vietnam where the U.S. Army interdicted the enemy's supplies, follow-on forces, reserves, and communication to impede his ability to commit these at a time and place of his choosing. It is felt that the principal difference in these type of operations now is the increased ability to conduct them at the tactical level as well as the operational level.

The activities that normally are conducted during deep operations are:

- * Deception.
- * Deep surveillance and target acquisition.
- * Interdiction (by ground or air fires, ground or aerial maneuver, special operating forces (SOF), or any combination of these).
- * Command, control, and communications countermeasures.

* Command and control."⁴

The Operational Level of employment of artillery is nothing new. The Soviets' utilized phased "artillery offensives" at the point of breakthrough during WW II. Extensive planning was involved and the fire support consisted of preparations, schedules, rolling barrages ahead of assaulting formations, and fires in support of the tactical breakthrough, artillery offensives sought to immobilize the enemy's forces throughout the depths of his positions. For the Soviet artilleryman, then, support of deep offensive missions is not an opportunistic tasking. It is deliberately planned and orchestrated carefully throughout the chain of command.⁵

Soviet artillery doctrine for offense consists of three phases, (1) Preparatory fires, (2) Fires supporting the attack, and (3) Fires through the depth of the enemy defense to support neutralization of successive and final objectives. The third phase provides fires through the depth of the opponent's defense that are planned to give uninterrupted fire support during the neutralization of successive and final objectives. Displacements of artillery normally are required during this sequence and are made so that not more than one-third of the supporting artillery is out of action at any given time.⁶

It is of interest that the Soviet artilleryman are very much aware of the vulnerability of their own artillery to counterbattery fire. Despite this, the Soviet's still tend to lay out their firing batteries in a straight line or lazy W formation. In fact the Soviet's view enemy artillery as the number one threat to their own artillery. Senior Soviet field artillery officers are

very cognizant of the radar locating ability of NATO. In the November 1980 issue of Vozenny Vestnik (Military Herald), was an article written by General-Lieutenant of Artillery E. V. Stroganov, in which he warned that NATO armies have modern radar direction finding capabilities that are able to determine the coordinates of the firing battery within 20-30 seconds, using the first round that has been fired by that battery.⁷ U.S. Field Artillerymen are well aware of this and have devised tactics to counteract or prevent mass destruction by Soviet counterbattery fire. These tactics must be adhered to especially in the nuclear capability artillery units if the artillery is to survive long enough to make a meaningful contribution to the AirLand Battle.

The successful execution of AirLand Battle will raise the nuclear threshold in Europe in particular and, in general, anywhere else we would face the Soviet or Warsaw Pact forces. It has long been recognized by the United States and its NATO Allies that it will be a formidable task to defeat the Soviet/Warsaw Pact forces in a conventional scenario, and as a result the U.S. doctrine is that it will use a first strike rather than lose the conventional battle in Western Europe.

Prior to the development of the Airland Battle doctrine, the U.S. Army's doctrine was that of trading space for time, it was called the Active Defense, in which the plan was to attrite the Soviets as much as possible while fighting in a defensive posture. The idea was to delay the Soviets long enough to allow for reinforcements to arrive in Theater. For a variety of reasons the doctrine of Active Defense was discarded. One reason was political, Germany took a dim view of a doctrine that would either abandon

German territory to the Soviets or would involve the early use of nuclear weapons. Another reason, perhaps more pragmatic, was that the Army leadership realized that if the Soviets were allowed to bring all of their combat power to bear at the Front Line Of Troops (FLOT), there wasn't any hope of defeating them. So Airland Battle of necessity was conceived, and one of the basic tenets is to attack the enemy deep in order to influence the enemy before he has the chance to bring his tremendous combat power to the FLOT. The idea is to take advantage of enemy weaknesses while avoiding his strengths. Another important side benefit of the doctrine is the improvement in morale that has resulted from the knowledge that the U.S. Military is planning to go on the offensive, and not simply wait and be pushed back into the Atlantic Ocean.

The methodology of accomplishing this is that of Deep Operations, of which the Deep Attack is an important part. The basic idea is that of attacking selected targets deep in the enemy rear to disrupt the command and control systems, slow up his movement to the front and to destroy or neutralize him. The deep battle is a continuous action designed to effect closure time of follow-on enemy elements. It creates windows of opportunity for decisive actions against leading enemy echelons. The primary tools for the deep attack include interdiction, (by air, artillery, and special operating forces), offensive electronic warfare, and deception.

One of the cornerstones of the Airland Battle Concept is that the Corps Commander will fight the Airland Battle. This makes the Corps Artillery Commander responsible for the conduct of the fire support planning and execution of the battle. One of the

key aspects of this is the articulation of the targeting philosophy or strategy, by the Corps Commander, that is to be used during the conduct of the battle. From this guidance the Corps Artillery Commander will develop the target allocation strategy. Contrary to what one might think, there will not be a dearth of targets. Instead the problem will be too many targets which, in turn, will quickly overwhelm the fire support system unless prior guidance is given as to which targets are important, then detect their whereabouts on the battlefield, and have the appropriate weapons systems and ordinance on hand to attack them.⁸

This has been one of the major deficiencies of the Field Artillery during exercises conducted at the National Training Center. Experience has shown that the average unit requires between four to five hours to process all of the targets and can not deliver fire on the right target at the required time, due to the sheer number of targets.

The questions are then, does the U.S. Field Artillery possess the capability to locate and identify targets in the second and third echelon, can the proper targets be sorted out, and then can the target be reached and destroyed with the present weapons systems on hand.

Faced with a numerically superior Threat, United States Army Artillerymen do not have enough resources to attack every target acquired. Therefore, target attack processing must be keyed to determining which targets out of the entire Threat array should be attacked to give the maneuver commander the greatest tactical benefit for the resources expended. One methodology that can be used is that of Target value analysis (TVA).

TVA links the effects of attacking a target directly to the target's function. It involves a detailed analysis of the Threat's doctrine, tactics, equipment, organization, and expected behavior. Information derived is then used during battle simulations that involve US and Threat forces and are based on the expected disposition of forces in likely contingency areas. Analysis of the outcome of the simulated battles results in a listing of which actions should be taken to defeat the Threat in different tactical situations. Target value analysis provides a systematic way of determining which targets out of the entire Threat array should be attacked for the greatest tactical benefit. These targets are called high-value targets.

It should be understood that targets have a situational value. For example, at the FLOT, a tank battalion is a significant threat and is a very important target to the maneuver battalion commander. However, 100 km before its arrival at the FLOT, the tank battalion is not as important to the success of the Threat's immediate mission as is an ammunition supply point or a fuel dump. As the distance from the FLOT increases, the value of combat forces decreases in favor of the combat support and combat service support forces and facilities. Recognition of this situational value element is important in targeting.

The target value analysis provides answers to three questions:

1. What are the important targets?
2. What targets are most vulnerable?
3. When and where are these targets most vulnerable?

Field commands are not expected to make a detailed target value analysis today. The results of the analysis conducted for Europe and Southwest Asia are now available and have been distributed to the field. The product available to units are target spread sheets and target sheets.

There are currently 17 target spread sheets for use in Europe or against Soviet/Warsaw Pact type forces in any mid- or high-intensity environment.

A target sheet is prepared for each potential high-payoff target. The target sheet identifies the target and provides information on the size, doctrinal location, vulnerability, signature array (visual and electronic), and probable impact of the loss of the target on the Threat's operations.⁹

The senior artillery commander is responsible for informing the staff of the maneuver commander's priorities for Target Acquisition (TA) and counterfire as part of the fire support mission. Additionally, knowledge of the maneuver's area of influence will help in determining the search zone and cuing guidance and will help in target development and information processing.

To give order and simplify the task of TA the battlefield forward of the Front Line Of Troops (FLOT) has been divided into five zones that contain successive belts of targets.¹⁰

The primary effort of visual acquisition is centered in Zone A which extends from 0 to 5 km and the objective is to identify and bring fire upon the most important or critical targets.

Zone B1 which extends from 5 to 20 km will probably include many counterfire targets. For planning purposes especially in a

European-type environment, visual acquisition assets will be of limited value in this zone. The primary TA capability beyond the FLOT includes:

- * The AN/MPQ-4A radar (out to 10 km).
- * The AN/TPQ-36 radar (out to 20 km).
- * The AN/TPQ-37 radar (out to 30 to 50 km).
- * The AN/TPS-25A or AN/TPS-58B Moving Target Locating Radar (MTLR) (out to 18 km but very terrain-dependent).
- * Sound ranging (out to 15 km).
- * The intelligence assets under the control of the Corps.
- * National intelligence assets.

Zone B2 is roughly 20 to 40 km beyond the FLOT. The FA target acquisition capability to acquire targets in the zone currently is limited to the AN/TPQ-37 radar.

Zone C which extends from 40 km to 60 km is the Zone in which enemy second-echelon units are expected to be assembled. This zone is of great importance for interdiction fires and maneuver strategy. However, the FA cannot acquire targets in this zone and must rely entirely on MI sources. Missiles and air assets normally are used to attack targets in Zone C.

The FA cannot acquire targets in Zone D, which extends from 60km to 150 km, but given target locations can attack with missiles. All target information must come from non FA sources. The majority of the targets developed will be maneuver assembly areas, long-range missiles, etc., which are primarily interdiction targets. Target information will be produced primarily by

intelligence sources under the control of the G2. The information comes from the corps tactical operations center (CTOC) support element via the intelligence officer to the Fire Support Element.

A modified version of the above scenario is utilized by V Corps Artillery as a tool for the Corps Commander and staff which use it to coordinate intelligence and fire support efforts. The Corps' targeting guidance is the basis for target data collection, target development, and attack decisions made in the fire support element.

The targeting guidance format divides close and deep operations into 3 areas of concentration.

- * Enemy divisions in contact.
- * Follow-on divisions.
- * Follow-on armies.

The enemy divisions in contact are the responsibility of the divisions. The follow-on divisions are the responsibility of the Corps in its execution of the deep battle. The follow-on armies fall under the Corps area of interest.

A simple example demonstrates how the targeting guidance and the fire support module work. The G2 predicts the movement of a follow-on motorized rifle division from its tactical assembly area into 2 possible approach avenues for commitment against the Corps at 0600 hours on Day X. The Corps Commander's guidance is to delay and disrupt this commitment until 1500 hours and to prompt its commitment into a southern avenue of approach. To support this scheme the G3 will execute a deception plan and alert the Corps' counterattack forces. The G2 will incorporate coverage of appropriate named areas of interest into his

collection plan and update intelligence of the battlefield products for selection of choke point target areas of interest. He will also plan for the use of collection resources that will trigger target activations. If it is determined that Battlefield Air Interdiction (BAI) available, then the Fire Support Element (FSE) alerts the appropriate Lance unit for a fire mission utilizing conventional ammunition. The G2 assigns electronic support measures through the MI technical control and analysis element which maintains the electronic order of battle. When the appropriate collector reports target activation, the fire support element establishes a time-on-target and issues the Lance and electronic fire mission. The G2 than monitors the attack and reports battle damage assessment.¹¹

The above example depicts one method of how the targeting guidance criteria has been adapted for use by a particular unit. The main point is not that it is done in the same manner as other Corps, but that a system exists which gives order and procedures to handle the overwhelming array of targets that will present themselves on the battlefield.

As mentioned above IPB in conjunction with Target Value Analysis (TVA) is utilized to enable commanders to attack targets such as follow-on elements to bunch-up and present themselves as lucrative targets. Elimination of enemy combat service support facilities and selected command posts would also generate enemy delay. It is important that special care be taken to obtain the effects which contribute directly to the success of the overall defense. To successfully conduct deep attack the Fire Support Coordinator (FSCOORD), G2, and G3 must cooperate fully to retain

a proper emphasis on the deep battle.

Normally, a maneuver deep attack will be initiated from a defensive posture and will be used to upset the enemy's timing and momentum. It will provide an opportunity for friendly forces to seize the initiative and gain the offense.

In the offense a deep attack is conducted primarily by fire to isolate, immobilize, and weaken the enemy in depth in order to sustain the momentum of the attack. As such, fires are planned to block the movement of enemy reserves.

In the defense the deep attack may be conducted by fires and/or maneuver forces. In either case, fires are planned to degrade and disrupt:

- enemy attacking echelons.
- enemy fire support.
- enemy command control and communications.
- enemy combat support and combat service support.

Lance and BAI are the current primary tools used to provide long range, deep attack fires, however when ATTCM'S is fielded it will greatly enhance the deep attack capability of the FA. When maneuver elements are used in the deep attack, artillery may be required to accompany the force. General Crosby Saint, III Corps Commander, has stated that this is doctrine in his concept of operations. A division committed to a deep attack behind the enemy lines would take its organic artillery with it, less wheel vehicles, and the artillery units would travel behind the lead maneuver battalion deployed in a wedge formation.

Initially the deep attack force will have to rely on the main battle area forces for the majority of its fire support.

Battlefield air interdiction and suppression of enemy air defense missions must be accomplished to prepare the route of advance and ensure either local air superiority or parity. Attack helicopters may be required to provide convoy protection, and offensive EW will be necessary to prevent the enemy from effectively redeploying to meet the deep attack force.

When the deep attack force has outdistanced the MBA artillery, organic mortars, accompanying artillery and CAS will provide the preponderance of fire support for the force.¹²

An example of one technique utilized to degrade and disrupt is that of lethal Command and Control Counter-Measures (C²CM). The underlying principle guiding the employment of lethal C²CM in support of corps operations is to use lethal C²CM to help decouple the enemy commander from his means of synchronizing forces and weapons and help slow his reaction to corps operations. At the very minimum, C²CM will help contribute to a growing enemy C² crisis within the enemy commander's decision cycle by increasing the difficulty of reacting to friendly actions which delay the enemy performance norms.

DEEP BATTLE

C²CM OPERATIONAL CONCEPT

C²CM GOAL--Desynchronize Soviet Army operations

- Attack troop control process to stretch decision times
- Reduce capability to concentrate combat power

C²CM PLANNING--Employment linked to corps plan

- C²CM missions derived from specific corps objectives
- Identify specific C²CM tasks to accomplish C²CM

missions

- Forecast opportunities to exploit C²CM targets

C²CM EXECUTION--Focus on functions, not emitters

- Primary C²CM targets are troop and weapons control centers
- Time C²CM attacks to reinforce specific combat-induced stress
- Closely correlated with deception at operational level

To guide lethal C²CM employment plans, the corps should apply a number of basic rules:

1. To support the corps battle plan, the objectives of C²CM, as indicated above, must be directly linked to the specific objectives of that battle plan, not to the isolated destruction or degradation of enemy emitters. For example, a corps battle objective of controlling the close battle will require lethal C²CM objectives that stimulate action to help slow the tempo of the forward movement of the unengaged enemy follow-on forces, as well as to force the enemy to alter his commitment plan for concentrating these forces.

2. Correctly targeted lethal C²CM has the potential to degrade enemy weapons control efficiency, and therefore weapons systems effectiveness, of Soviet weapons systems. This capability in concert with the ATACMS Block II warhead will allow the attack of not only the Threat's command centers, but second echelon combat vehicles as well.

3. C²CM targeting of Soviet troop control and weapons control centers should not be accomplished in isolation. To

achieve the highest leverage payoff and to exert maximum stress on the enemy C² structure, Soviet troop control and weapons control centers should be targeted in conjunction with each other and with friendly maneuver and/or fire support activities.

4. Attacking Soviet troop control and weapons control centers can be best accomplished by targeting for clusters rather than individual emitter targets.

5. The uncertainties surrounding the probabilities of relative coincidence of activity between enemy emitter duty cycles and friendly detection coverage is highly dependent upon the vagaries of enemy emitter activity, detection system capabilities and collection management.

6. It should never be assumed that a single C²CM attack against a troop control or weapons control center totally degrades the C² function of that center. If the center's function was important enough to warrant initial targeting, then some level of C²C should be continued as long as the particular C² function remains an important aspect of the enemy's capability to interfere with friendly objectives.

7. Emitters directly related to specific weapons application, such as the radars supporting ADA defense weapons, can be attacked as individual targets rather than as a target cluster. However, even in these cases, there are also other emitters, i.e., radios, in the immediate area that are required to accomplish the particular function. These other emitters should also be attacked.

8. Soviet emitters within 10km of the FLOT should not be targeted with corps lethal C²CM weapons when acquisitions of these emitters can provide locations that fall within the weapons

effects radii of divisional conventional fire support means. There are exceptions, however, for those emitters that support especially damaging enemy weapons activity, such as counter mortar/counter battery radars.

The targeting procedures can be used to plan and control the attack of the different types of lethal C²CM deep targets required to support the variety of corps operational level objectives. For example, even when the primary deep attack target is a follow-on regiment of enemy armor, that attack will require that appropriate friendly sensor, C², weapon and communication systems interoperate in detecting the attack trigger event and in initiating the launch of the weapon. To ensure that these combinations of friendly systems are capable of performing their respective roles, those specific enemy air defense assets which can disrupt the sensors must be eliminated or at least suppressed. Specific enemy Radio Electronic Combat (REC) elements which could degrade either sensor detection or communications must also be attacked. Further, the CP of the enemy echelon of command directing the enemy armor regiment to accomplish its objective should also be attacked to compound and reinforce confusion and indecision.¹³

It is clear that warfighters should plan for and utilize fire support plus maneuver for deep operations in an operational context. The tremendous conventional force capability of the Soviets dictates that targets be identified and engaged as soon as possible, in order to prevent them from arriving at the FLOT. Nato doesn't have the strength to defeat the Soviets, if they are allowed to move their forces unhindered to the FLOT. To achieve

this objective NATO corps cannot permit the second-echelon division of the first-echelon army to be committed. These divisions must be engaged as they are moving to, occupying, or departing final regimental assembly areas.

DEEP ATTACK

WEAPON SYSTEMS CAPABILITIES/LIMITATIONS

US Field Artillery systems do not have the necessary range that will permit its full participation in the Airland Battle. Today's field artillermen do a good job in providing indirect fire support and in integrating the application of various fire support means during close-in operations. But they will experience distinct qualitative and quantitative limiting factors that will undoubtedly handicap the branch's participation in the tremendously larger operations envisioned by deep operational theorists. To meet these larger challenges, the U.S. Field Artillery must come to grips with the following limitations.

* Fire Support at the Operational Level. The corps commander's capability to command and control the fire support assets necessary to win deep offensive action must be improved. Specifically, the range and lethality of field artillery attack systems must be increased out to a depth of approximately 150 kilometers. It goes without saying that the TA capability must also extend to out to that depth.

* Allocation of Fires. The crux of the problem facing the corps and higher level commanders is how to conserve and pool fire support resources in order to attack deep at the point of

decision. This is a perplexing problem in light of the inevitable heavy demands for support of the close and rear area battles. The future fire support systems will require better methods to facilitate anticipated operations than the routine assignment of on-order missions or the articulation of priorities of fires.

* Targeting Philosophies. The FA must move toward a better approach in the business of targeting. In the past, the system tended to become inundated with targets. Basically the system reacted to the targets. As stated above target guidance must be decided upon and issued in advance as which targets are important, than detect their whereabouts on the battlefield, and finally deliver the appropriate ordnance.¹⁴

CURRENT EFFORTS TO UPGRADE DEEP ATTACK CAPABILITIES

The thrust of the Field Artillery is to provide the requisite fire support to a Combined Arms Team capable of winning an AirLand Battle. The five specific elements are:

* Increased lethality - As the Threat forces have become heavier and more mobile, the Field Artillery has had to increase its lethality through the development of new munitions which will produce a greater assurance of target defeat. Some of these developments are as follows.

- ~ 105-mm Dual-purpose improved conventional munition (DPICM)
- ~ 105-mm rocket assisted projectile (RAP) with an increased range of up to 20 km.
- ~ 155-mm fire and forget projectile. The major candidates

are the Copperhead II and the conventional geometry spin projectile (CGSP).

- ~ Sense and Destroy Armor (SADARM).
- ~ MLRS Terminally Guided Warhead (TGW). Will be able to attack moving hardened targets on the battlefield.
- ~ Army Tactical Missile System Block II Warhead. Will provide the ability to attack hard battlefield targets at a very great range.

* Improved personnel-to-weapon ratios and survivability.

This involves mainly the upgrading of existing weapons systems to make them more efficient as well as the introduction of new systems that are not only more efficient but require less troops to man them.

* Seeing better and deeper. An important aspect of this is the Aquila program. The Aquila is a remotely piloted vehicle (RPV) that is a highly versatile air platform that can gather intelligence, adjust indirect fires, and provide real-time video imagery to the supported unit as well as identify and designate targets for destruction by laser-guided munitions such as the Copperhead. The current operational concept of the RPV will enable the Army to deploy a survivable air vehicle 20 km beyond the FLOT.

* Improved command, control, and communications. This area involves the introduction of new radio systems as well as upgrading the Field Artillery's meteorological capability with the fielding of the meteorological data system (MDS), and the procurement of additional position and azimuth determining system (PADS).

* Attacking deeper. I would like to concentrate on this bullet regarding Attacking Deeper. The Field Artillery seeks weapons which will not only out-range those of any opposing force but also hit targets before they enter the close-in battle. Specifically, the FA seeks weapons that will have the following objective ranges:¹⁵

Light Cannon.....	20km
Heavy Cannon.....	40 to 50km
Rocket.....	70km

To date the following weapons systems have been developed in an attempt to meet the requirements listed above.

M110A2 - This is a 203-mm heavy canon that has been greatly improved in range during the past several years, a long tube has been retrofitted to the basic automotive chassis, the hydraulic system was strengthened, charge 8 and 9 were made available along with a rocket assisted projectile (RAP) round. These improvements enables the M110A2 to achieve a range of 30,000 meters.

M114A2 - This model was changed from the M114A1 by changing the rifling in the barrel from 1 in 20 to 1 in 25 which enables the weapon to use the projectiles and powders used in the M109 series, this has increased the range of the weapon to 19,300 meters when firing a RAP round.

M109-HIP - Has a range of up to 24,000 meters when firing a M549 RAP round.

M119 - Nondevelopmental 105-mm howitzer made in the

United Kingdom. Range 19,500 meters with RAP round.

M198 - Is a 155-mm howitzer, range is 30,500 meters with RAP round.

MLRS - Currently replacing the M110 in the division, one MLRS battery has the firepower of a battalion of M110's. Range is in excess of 30,000 meters.

Lance - Is an all weather, day and night, nuclear and conventional missile. Range in the conventional mode is 91 km, and engages soft targets such as air defense and logistic sites. In the nuclear mode the range is 133 Kilometers.¹⁶

The Army tactical missile system (ATACMS) is a new conventional weapon that promises to give corps artillery commanders the fire support means to strike deep behind enemy lines. It will be fired from a modified version of the MLRS. Plans call for two type of munitions, block I and block II. The block I warhead is designed to attack personnel and light materiel targets using M74 Lance submunitions. The program also calls for future technology advancements to include the block II warhead which will use terminally guided submunitions for attacking combat vehicles. ATACMS will range well beyond the ranges of today's cannon, rocket, and Lance missile fires.¹⁷

As is fairly well evident even with these weapon system improvements listed above, there is still a major short coming in the Heavy Cannon objective range. True the MLRS classified range may be able to extend out to 40 km, however one must remember that it basically an area weapon. Moreover, other than the lance, which is no longer in production, we cannot meet the objective range for missiles. The only cure for these problems is that of

time and a considerable amount of money.

It is questionable, at the present time, if the U.S. Field Artillery can provide the timeliness, quality and quantity of fires necessary to fulfill its expected role in the AirLand Battle. The areas of concern continue to be the ability to range deep targets, to plan for and deliver fire on the appropriate targets in a timely manner.

Additionally there is concern by some in the artillery community that we are too technology oriented, that we need to put more money into fielding new artillery canon systems that will not only range but preferably outrange the Russian artillery. This is especially true in the era of declining R&D and procurement budgets.

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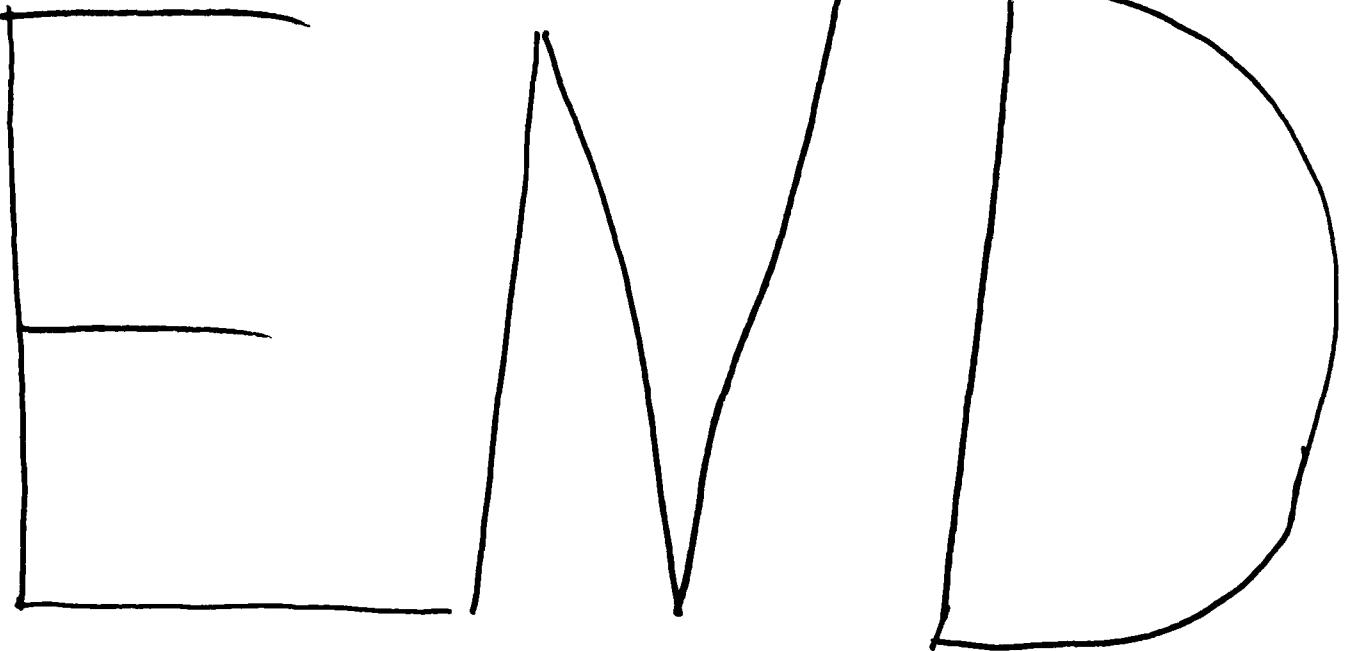
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